Change Request form

General Information (Origin of Request)
☒ User Requirements Document (URD)
☐ User Detailed Functional Specification (UDFS)
☒ User Handbook (UHB)
☐ Other User Functional or Technical Documentation (SYS)

Request raised by: TSWG	Institution:	Date raised:

Request title: TIPS Enhanced Information Database	Request ref. no: TIPS-0051-URD

Request type: Change request	
1. Legal/business importance parameter: M	**2. Market implementation efforts parameter – Stakeholder impact:** L
3. Operational impact: H	**4. Financial impact parameter:** M
5. Functional/ Technical impact: H	**6. Interoperability impact:** M
Requestor Category: Central Banks	**Status:** Allocated to a Release

Reason for change and expected benefits/business motivation:

The current TIPS production of statistics relies on the EPC framework that envisages a monthly/quarterly set of indicators related to the scheme processing which include Instant payment, recall, investigation and error scenarios. The same framework, with some minor adaptation due to specificities related to the different currency, has been offered also to non-euro communities (e.g. the Swedish banking community). The outcome of a dedicated TSWG written consultation raised the need for having additional statistics on top of the current "EPC stats", e.g. by adding several different analysis dimensions and granularity such as external (beneficiary) error codes, further info about transaction values and most active participants to be offered following a "self-service" and "pull" approach. Moreover, the enrichment of the current TIPS production of statistics is important for compliance with the SIPS Regulation, as recommended by the Overseers.

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Description of requested change:

In addition to the enhancement of the structured queries introduced with TIPS-0026-URD and TIPS-0048-URD, the current change request caters for (i) the migration, (ii) redesign of the existing information database and (iii) the provision of a query and presentation tool that will exploit the new dimension of analysis introduced with the TIPS Enhanced Information Database (EIDB).

Migration of the Information Database

The information database is fed with data from the Operational Database. The current solution must be enhanced to meet the increased demand in terms of service levels and computation, to cope with the expected number of transactions that TIPS is designed to process, while allowing TIPS actors to exploit TIPS transactional data in pull mode. While structured queries from the GUI will work in "near real-time", the data loading from the TIPS Operational Database into the new Enhanced Information Database will be scheduled on a daily basis.

Redesign of the Information Database

The refactoring of the logical and physical data model is deemed necessary to introduce the new dimensions of analysis and data aggregations, while at the same time the backward compatibility with the EPC statistical requirements shall be safeguarded.

Data aggregation is one pillar of the EIDB implementation, necessary to provide adequate response times and make transactional data online and available for statistical purposes for a period longer than three months[1].

At least the following new data aggregations will be defined on the basis of the granular transactional information recorded in TIPS:

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[1] The exact period will be clarified within the DA performed by the 4CB at a later stage, as it is a trade-off between the level of aggregation and the retention period.

- Business date;
- Credited and debited account;
- Party BIC associated to each account (e.g. TIPS participant or reachable party);
- Type of transaction (e.g. Liquidity Transfer, Instant Payment, Positive Recall Response);
- Status of the transaction (e.g. settled, failed, rejected);
- Error code[2] (i.e. both internally generated in TIPS and externally generated by the Beneficiary PSPs);
- Currency denomination.

Data aggregation in the EIDB should allow to comply at least with the requirements stemming from the "ECB Guideline 2021/832 on reporting requirements on payments statistics (ECB/2021/13)" listed below.

TIPS National Central Bank (NCB) users shall be provided with access to the data belonging to their national community, such as:

- total volumes (domestic and cross-border) and values of settled instant payments and positive recall answers on TIPS Dedicated Cash Account (DCA) holder(s) and TIPS Ancillary System Technical Account(s) (ASTA);
- statistical data to be provided at a country level jointly (e.g., all TIPS DCAs and TIPS ASTAs transactions reported jointly for a selected period).

Liquidity transfers are excluded from the reported data (e.g. between TIPS DCA and TIPS ASTA).

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Query and presentation tool

EIDB data exploration and visualization will rely on a new tool that leverages the TIPS data infrastructure by exposing business intelligence features, interactive dashboards and the option to write custom queries on the aggregated data layer as defined above.

TIPS National Central Bank (NCB) users will be provided with access to the data belonging to their national community through a dedicated tool accessible via Graphical User Interface. Both the TIPS Operator and the European Central Bank will be able to browse TIPS data from a system-wide perspective.

By means of this tool, the authorized users shall be able to compile and save their own queries[3] on the aggregated data, create custom visualization for business reporting, produce graphs or tabular data and export the results to the local workstation. Different user profiling, such as 'NCB advanced user' or 'NCB analyst', is directly granted by the tool offering the possibility to segregate the user profiles depending on the different NCB departments' needs.

Shall be envisaged the possibility to grant access to system-wide TIPS data to authorised Central Bank users.

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Submitted annexes / related documents:

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Proposed wording for the Change request:

No impact on the TIPS SDD is envisaged stemming from this Change Request.

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High level description of Impact:

Similarly, to the TIPS RACE, this CR is merely technical as it envisages the migration and the reorganization of the existing Information Database in a way that it can support the extended statistical requirements the market is demanding for. Moreover, a EIDB presentation tool shall be added to the system footprint in order to guarantee the autonomous aggregated data exploitation.

A functional testing campaign is nevertheless envisaged not only to make sure the new Enhanced Information Database is still backward compatible with the current statistical framework and it is not hampering the existing statistical reports but also to validate the requirements expressed in terms of data visibility and aggregation.

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Impacts on other projects and products:

No impact is foreseen on other TARGET Services:

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[2] This level of aggregation will expose the error code details (e.g. 'AC04', 'AB06', etc.).

[3] The statistical indicator produced, depending on the user filtering criteria, may contain information on transaction volumes and values.

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- CSLD no impact
- ECMS no impact
- T2S no impact
- TARGET2 no impact

Outcome/Decisions:

L3 analysis - General Information
Impact on TIPS
Business Interface
A2A Interface
U2A Interface
Settlement Engine
Payment Transaction
Liquidity Transfer
Recall
Queries and Reports
Queries
Reports
Other functions
Local Reference Data Management
Statistics
Complex Queries and Reports
Mobile Proxy Look-up
Common Components
ESMIG
CRDM
Archiving

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	Billing		
	DMT		
Operational Tools			
	SLA Reporting		
	TMS		
	Technical Monitoring		
	Change Management		
	Capacity Management		
Infrastructure request			
	Application components impacted		
	Application components not impacted		
Operational activities			
	Business activities impacted		
	Technical activities impacted		
New functionalities			
X	Enhanced Information Database (EIDB)		

Impact on documentation		
Document	**Chapter**	**Change**
TIPS UDFS	n/a	
TIPS UHB	n/a	
Training documentation	n/a	
Other documents		

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Overview of the impact of the request on TIPS (L2 view)
Summary of functional, development, infrastructure, operational and security impacts

Summary of functional impact:

No functional impact is detected on the TIPS SDD stemming from this Change Request that is merely technical.

In case the access to the EIDB Tool is granted via ESMIG the capture of a new privilege may be required in CRDM to allow user access to this specific TIPS Application.
However, from an access rights viewpoint no distinction will be made in CRDM/TIPS on the different access profile defined in the requirements (namely the 'NCB advanced user', 'NCB analyst' and 'System-wide user'). The implementation of these roles shall exploit the feature offered by the EIDB tool, e.g. by accessing segregated views on aggregated data.

A functional testing campaign shall be jointly orchestrated with the Development team in order to test at least the following functionalities:
- Access rights functionalities and data visibility (view implementation);
- Statistical indicators for NCBs following the Guideline 2021/832 on reporting requirements which shall comprise: (i) total volumes (domestic and cross-border) and (ii) values of settled instant payments and positive recall answers both on TIPS DCA and TIPS ASTA, (iii) statistical data to be provided at a country level over a selected period.
- Similar checks on a currency other than euro shall be covered by the internal testing campaign.
- Non-regression testing on the statistical reports for EUR and non-EUR currencies (e.g. EPC Monthly report, monthly report for SEK).

Summary of application development impact:

The CR is broken-up into two parts: first a new "extraction-transformation-load" (ETL) process that will make available a new table of facts with an aggregated view of number of operations and amounts. A second part is responsible for allowing users to exploit this table, and consists of an *off-the-shelf* tool.

ETL process

The new table of facts will contain **single account records** (whereas a *transaction* is composed of two simultaneous records of different directions and posting two accounts) and will be built alongside the current EPC statistics tables and, in future, might replace these latter (nevertheless, this is not in the scope of the current CR).

The aggregation will happen on a **daily basis** and the retention period will be of **three months**, in line with the current principles of the Information database. Further increase of the retention period may be possible if the transaction error codes are grouped into a few (i.e. 3 or 4) categories.

Aggregation key:

#	Name	Note
1	Calendar date	
2	Business date	

3	Transaction type	Instant Payments, Recall Response, Liquidity transfer, Intra-services LT (to be added)
4	Transaction status	Settled, Unsettled, Pending, Expired (to be added)
5	Currency unit	
6	Direction	D: Debit, C: Credit
7	Country code	It refers to the Originator party or to the Beneficiary depending on the Direction. Same as EPC statistics
8	BIC	It contains Originator BIC or Beneficiary BIC depending on the Direction
9	Account	Account technical id. It contains Debit Account or Credit Account depending on Direction
10	Transaction error code	It includes TIPS error code and the error code received by the beneficiary (as TIPS error code and beneficiary error code are mutually exclusive) *(It may be necessary to group the error code into 3 or 4 categories in order to enable a longer retention period)*

Aggregated data:

#	Name	Function
1	Amount	Sum
2	Records	Count

Data access tool

The tool for accessing the new table of facts, with the following characteristics:

- It will allow access to ECB/NCB users via NSP network infrastructure, through the ESMIG portal.

- The tool will be integrated with the IAM, receiving user and role information of the already authenticated user.

- Each user will be given the access to the data belonging to the proper country (ECB's users will be allowed to access all data). More into details, a user belonging to the NCB of a country will be given access to the rows linked to same country.

- The proposed tool will consist of an adapted installation of Apache Superset *open source software*. Such a tool is only available as public version, under GPL license (Apache License, Version 2.0) and, as such, no software vendor will support the operation of the software. This implies that serious software malfunctions or the emergence of critical vulnerabilities may lead to the interruption of the service.

- The tool will be available, with some dummy data and in an offline version, alongside this CR to make possible to evaluate its adequateness to the expectations. This will allow performing a ***proof-of-concept* of this part of the solution that may lead to a re-assessment of this function in the event of significant changes or adaptation of the tool or if the tool appears as inadequate to the needs and must to be replaced with some other software product**.

Summary of infrastructure impact:

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Apache Superset will be added as an intermediate layer in front of the currently existing Oracle. New servers will have to be deployed as an underlying infrastructure (three in total, one per data center).

Summary of operational impact:

- ETL process
- Management (patching, version upgrade. …) of the data access tool

Summary of security impact:

See Change Request analysis.